

down along the shaft without extrusion of the grease at the ends of the protecting tube. In this instance an extensible or expansible tube 61 is provided around the shaft 10 at the cut-away part 13^b of the bracket 13. This is brought about by providing in the tube, and in this instance at the top, a threaded extension 62 in the form of a nut which can be turned by a wrench to cause the lower end of the tube and the top of the nut to very tightly engage the bracket. Additionally the lower end of the tube and the upper end of the nut are tapered and these engage tapered seats on the bracket as shown at 64 and 65. Obviously by turning the nut or tube extension 62 the lower tapered end of tube 61 can be forced tight against the lower tapered surface of lower bearing 12 and the tapered upper end of nut 62 is at the same time forced tight against the upper tapered seat of the bracket, so as to prevent loss of grease at these joints.

Grease is supplied to lubricate the bearings for shaft 10 from a grease cup 66 which is screwed into the upper part of the bracket surrounding bearing 11. Opposite this grease cup the bearing 11 has an external annular groove 11^a. A set screw 11^b extends through the bracket, and its inner edge engages in this external groove 11^a to hold the timer case and its lower extension constituting the bearing 11 from endwise movement on the shaft.

An opening extends from the base of groove 11^a to the inner surface of bearing 11 so that grease may be supplied to lubricate the upper bearing shaft.

Additionally the lower end of bearing 11 is provided with internal and external vertical grooves 11^c which extend downward from the annular groove 11^a to the lower end of bearing 11 so that grease may pass freely downward into the space between tube 61 and the shaft so as to lubricate the lower bearing 12. Additionally there is provided for the full length of bearing 12, a vertical groove 12^a, through which an ample quantity of grease may be forced down from the space between the shaft and tube not only to secure good lubrication of bearing 12, but to feed the grease into the gear housing or cup 13^a so as to provide ample grease for lubricating the gears therein.

The several novel features above described are of a very practical nature as they improve the device both from electrical and mechanical standpoints as they provide greater efficiency, greater durability, and decrease the likelihood of derangement and trouble.

We do not desire to be confined to the exact details shown, but aim in our claims to cover all modifications which do not involve a departure from the spirit and scope of our invention.

Having described our invention, we claim:

1. In an ignition apparatus for a system having primary and secondary circuits, a rotor carrying a brush and a case enclosing the rotor and having spaced contacts adapted to be engaged by the brush, said brush and contacts being adapted to be included in the primary circuit, said case additionally enclosing a circuit breaker for interrupting the circuits established by the engagement of the brush with the contacts, and a condenser for bridging the contact points of the circuit breaker, said condenser being carried by the rotor.

2. In an ignition apparatus for a system having primary and secondary circuits, a rotor carrying a brush, a case having spaced contacts adapted to be engaged by the brush and said case enclosing also a circuit breaker for interrupting the circuits established by the engagement of the brush with the contacts, said brush and contacts being adapted to be included in the primary circuit and additionally a condenser for bridging the contacts of the circuit breaker, the circuit breaker being composed of relatively movable members carried by the rotor.

3. In an ignition apparatus for a system having primary and secondary circuits, a rotor, a case enclosing the same and provided with a set of contacts to which conductors are adapted to be connected, the rotor comprising a body having a brush for engaging said contacts and carrying a circuit breaker and also a condenser for bridging the contacts or points of the circuit breaker, said brush and contacts being adapted to be included in the primary circuit.

4. In an ignition apparatus for a system having primary and secondary circuits, a rotor, a case enclosing the rotor and having contacts or segments to which conductors are adapted to be connected, said rotor comprising a member carrying a brush adapted to engage said contacts and provided on the one side with circuit breaker members and on the other side with a condenser adapted to bridge the same, said brush and contacts being adapted to be included in the primary circuit.

5. In an ignition apparatus for a system having primary and secondary circuits, a rotor, a case enclosing the same and carrying contacts or segments to which conductors are adapted to be connected, said rotor comprising a body having a brush adapted to engage said contacts and provided on the lower side with the relatively movable elements of a circuit breaker and on its upper side with a condenser having its terminals connected to said elements of the circuit breaker, said brush and contacts being adapted to be included in the primary circuit.

6. In an ignition apparatus for a system having primary and secondary circuits, a